Remarks/Arguments

Claims

Claims 5, 18, and 23-35 were pending in the application. All claims were rejected. Independent claims 5, 18, and 29 are currently amended and dependent claims 23-27, and 30-34 are currently amended. Claims 36 and 37 are new. Claims 5, 18, and 23-37 remain.

Rejections under 35 U.S.C. 103

Claim 5 was rejected under 103(a) as being unpatentable over Li (U.S. 4,633,309) in view of Manchester (U.S. 6,144,399) and Langlais (U.S. 6,019,932).

Claim 5 has been amended to clarify that the reflection introduced by the network interface device produces a multipath signal in the wiring branches that creates impairments to the performance of the communication channel and the signal modulation used by the terminal devices is orthogonal frequency division multiplexing to overcome the communication channel impairments caused by the network interface device and that the network interface device provides a path for terminal devices to transmit to and receive from other terminal devices and wherein terminal devices communicate directly with each other to form the signal distribution network.

No new matter has been added. Support for these amendments to claim 5 are found in the application at page 12, line 24 to page 13, line 4; page 17, lines 27-30; page 6, lines 9-11; page 9, lines 3-6; page 3, lines 31-32; and page 7, line 32 to page 8 line 4.

Regarding the present claims, there is no suggestion or motivation in the references or in the knowledge generally to modify the references or combine the teachings. Neither Li nor Langlais recognizes the multipath condition created by a signal reflection intentionally created within the building wiring, therefore, neither reference suggests or provides motivation to apply OFDM modulation to reflected signals in coaxial cable building wiring to enable communication over the

wiring. Manchester deals with merging telephone and broadband signals onto on coaxial cable and does not teach either reflecting signals or OFDM.

Langlais discloses OFDM for head-end to terminal communication and recognizes that "OFDM is more robust against time domain impulse interference due to its long symbol time… classic impulse noise spreads uniformly across a communication's channel", Col 10, line 55-58. Langlais does not recognize the problem of frequency selective channel impairments caused by signal reflections created by having a signal reflector at the point of entry. **Langlais does not disclose the use or benefit of a signal reflector to create a network signal path.**

Li discloses a signal reflector at the point of entry for reflecting a signal transmitted by a master decoder to several slave decoders. **Li does not recognize the multipath environment created by the high pass signal reflector.** Further, the control message of Li is a narrow band signal that would not require mitigation of impairments. The nature of Li's system is different from applicant's. In Li, the signal transmitted by the master decoder originated at the cable head end, is received by the master decoder, then frequency translated and transmitted towards the point of entry to be reflected by the high pass filter at the point of entry. Communication starts from the head end, passes through the master decoder to the reflector, then to the slave decoders. Communication between slaves is not disclosed and a network among the slaves is not disclosed.

In Li, a slave decoder can receive messages only from a master decoder: "the slave decoder cannot receive control messages other than those which are retransmitted from its master decoder." Li, Col 2, lines 66-68. Li does not disclose a system that creates a network of the terminal devices where terminal devices communicate with other terminal devices, but instead Li only discloses a system that allows one device to broadcast to several devices. Only the master decoder of Li transmits, the slave decoders only receive and they receive messages only from the master decoder. A network is not formed where terminal devices communicate directly with each other, as claimed in claim 5.

It would not be obvious to combine the OFDM transmission system of Langlais with the signal method of Li. Langlais teaches a two-way point to multipoint transmission system using OFDM to establish communication between one upstream unit and a plurality of downstream units. Langlais does not

teach communication between the down stream units. Claim 5 claims communication between the terminal devices. The other reference, Li, does not recognize the multipath environment created by the high pass signal reflector and the need for a mechanism to overcome the channel impairments causes by the multipath signal created by the reflector. There is no motivation in Li or Langlais to apply the teaching of Langlais because there is no problem identified in Li or Langlais of channel impairments due to the signal reflector, as claimed in claim 5. It is only applicant's disclosure that recognizes the problem of multipath condition and the need to overcome the channel impairments when employing a signal reflector, and thus only applicant's disclosure presents the motivation to combine OFDM with a signal reflector. See application page 17, lines 27-30.

Neither Li nor Langlais discloses a network where terminal devices communicate with each other. In both Li and Langlais the slave or down stream units communicate only with a single device, the master or headend unit.

Claim 5 is patentable over the combination of Li and Langlais and allowance is respectfully requested.

Claim 18 has been amended to include the limitation of using time division duplex protocol for communications that are synchronized by broadcasting a beacon message on the network. No new matter has been added. Support for this limitation is found in the application at page 14 lines 13-16. None of the references disclose the use of a beacon message to synchronize communications.

Claim 23 and 24 have been amended to clarify that adjustment of modulation and power level, respectively, at each OFDM carrier frequency is to overcome frequency selective channel impairments present in the coaxial building wiring caused by the reflections from the network interface device. No new matter has been added. Support for this limitation is found in the application at page 17, lines 27-29.

Claim 25 has been amended to clarify that the coaxial cable building wiring is used as a communication channel and that a "reflected signal path is created that produces a multipath signal in the wiring branches that creates impairments to the performance of the communication channel;"

and (ODFM) modulation is used to overcome the communication channel impairments caused by the network interface device. No new matter has been added, support for these amendments are the same as for claim 5. Claim 25 should be allowable as argued above for claim 5.

Claim 26 and 27 have been amended in a manner similar to claims 23 and 24 and should be allowable along with claim 25.

Independent claim 29 has been amended to clarify that the reflected signals produces a multipath signal in the wiring branches that creates impairments to the performance of the communication channel. Claim 29 has been further amended to include the limitation "equalization on the received signal that restores a flat frequency response to overcome the communication channel impairments caused by the multipath signals". This limitation was essentially in previous claims 30 and 31 and further clarifies the function of the equalizer.

Claims 30 and 31 have been amended to remove the limitation moved to claim 29. Claims 29-31 should be allowable with amended claim 29.

Claims 32 has been amended to remove the limitation moved to claim 29. Claims 33 and 34 have been amended to clarify that OFDM is used to overcome the communication channel impairments caused by the reflected signals in addition to the use of equalization. Claims 32-35 should be allowable with amended claim 29.

Equalization disclosed and claimed is useful for correcting impairments to the frequency response of the channel caused by multipath signals that result from the signal reflector. Equalization is not taught by Li or Langlais; neither reference recognized the need for equalization caused by a reflection, particularly a reflection intentionally introduced by the network interface device. Applicant identifies the problem that "In the frequency domain, a reflection produces ripples in the response of the channel, creating amplitude variations across the pass band." Application page 12, lines 39-31. Applicant discloses the solution: "An adaptive equalizer in the terminal device receiver creates a filter response that restores a flat frequency response impaired by the multipath signal." Application page 13, 4-7. Mukherjee (U.S. 6,226,322) discloses equalization on the received signal in a digital-subscriber-line

system, where each terminal communicates only with a central office. Mukherjee's system does not employ a signal reflector to enable device-to-device communication and does not address multipath caused by a signal reflector. The use of an equalizer along with the other elements of applicant's claim, in a network with an intentional signal reflector at the point of entry, is not found in or suggested by Mukherjee or the other prior art.

New claims 36 and 37 have been added and dependent on base claims 25 and 29. These claims add the same limitation as claim 18 discussed above.

Conclusion

In view of the foregoing, claim 5, 25, and 29 as amended distinguish the claimed invention from the prior art. These independent claims and the related dependent claims are allowable and such action is respectfully requested.

If it is felt that direct communication would serve to advance prosecution of this case, the examiner is invited to call the attorney at the below listed telephone number.

Respectfully submitted,

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